FARBER ENERGY DESIGN
1990 N. California Blvd. Suite 830 Walnut Creek CA 94596 925·926·0425 Fax 925·926·0435

November 20, 2002

Bill Pennington
California Energy Commission
1516 9th Street
Sacramento, CA 95814

Subject: 2005 Title 24 Low-Rise and High-Rise Residential Standards

Dear Bill,

I have reviewed the latest draft 2005 Standards, and forward the following comments to you for your consideration:

1. Subchapter 5 (page 83) High-Rise Residential. Currently, lighting efficiency is not regulated in common areas of low-rise multi-family buildings. There is no particular reason for the standards to differentiate residential buildings based on whether they are low-rise or high-rise. There are low-rise multi-family buildings with central HVAC systems, and it is not uncommon for high-rise residential buildings to have individual dwelling unit HVAC systems. Also, the low-rise residential standards do not accurately model large HVAC systems, as commonly found in common areas of multi-family buildings.

   Proposal: In order to expand the amount of regulated lighting, change the residential building classifications to "Single-Family", "Small Multi-Family" and "Large Multi-Family". Large Multi-Family might be 20 dwelling units or larger. Small Multi-Family would be subject to what is currently referred to as Low-Rise Residential requirements. Large Multi-Family would be subject to what is now known as High-Rise Residential requirements. The ACM for Large Multi-Family buildings would set the standard HVAC system as either an individual dwelling unit system or a central building system, to match the proposed design.

2. Sect. 143(a)5. Windows. The High-Rise Residential (or Large Multi-Family – see no. 1 above) glazing allowance would be more practical if it were based on floor area. This is because the comparison of glazing areas to conditioned floor area is easier to check, especially for complex building shapes. Glazing to floor area ratios have a smaller typical range in multi-family buildings than in nonresidential buildings, making a floor area based standard practical.

   Proposal: For High-Rise Residential (or Large Multi-Family), base the prescriptive allowed glazing area on the conditioned floor area. The allowance should be 12% in inland climate zones and 14% in coastal climate zones, consistent with CABEC's position on low-rise multi-family residential glazing, which is based on typical design

practice. Credit should be given for designs that have less glazing area than the prescriptive allowance.

Alternative Proposal: If the proposal to regulate large residential building glazing areas as a function of floor area is not acceptable, then the proposal to eliminate credit for less than 10% glass for nonresidential and high-rise residential buildings should be changed to apply only to nonresidential buildings.

3. Sect. 150(d). Raised Floor Insulation. The Standards do not require insulation at raised concrete floors (although the Standards have required this in the past). Apartments located on uninsulated concrete raised floors are subject to much inferior comfort and much higher heating energy needs than apartments located elsewhere in a multi-unit building. Reinstating the floor insulation requirement is a matter of equity

   Proposal: Reinstate the insulation requirement for raised concrete floors. This previous mandatory measure was eliminated after a cost effectiveness evaluation. However, CEC staff has informed me that each measure does not individually have to be cost effective. Rather, all required measures evaluated as a whole must be shown to be cost effective.

   In this regard, evaluate the requirement of a lower R-value if the insulation is placed between the structural slab and the finished floor, rather than under the slab. Insulation above the slab is much more effective because the floor does not suffer the large edge losses associated with slabs insulated from below.

4. Sect 150(h)1. Building Cooling and Heating Loads. Require structural shading to be included in cooling load calculations (to limit oversizing).

5. Sect 150(k)2. Kitchen Lighting. There are two issues regarding the Exception that allows some inefficient lighting:

   A) According to testimony at the Nov. 18 workshop, lamp efficacy is regulated by lamp wattage only, not luminaire wattage. To calculate the luminaire wattages for compliance under the Exception, clarify whether lamp or luminaire wattage is used.

   B) This section requires a calculation of proposed lighting wattage. Since incandescent fixture rated wattage is often not known at the time Title 24 documents are prepared, the Residential Manual will need to establish minimum assumed wattages for all types of screw-in lamps (including halogen).

6. Sect 150(k)4. Pendant, Track and Recessed Luminaire. There are two issues regarding the Exception that allow for some inefficient lighting:

   A) For track lighting, what constitutes compliance with the “high efficacy luminaire” requirement? If a track has removable track heads, can it comply with this requirement? If a track has only one track head installed, which has a high efficacy lamp, is that enough to qualify (even though the owner can easily add non-complying track heads to the system)?

B) There are no requirements under Section 119 for dimmer switches. I believe that some dimmer switches limit power in relative proportion to lamp light output, while others employ a heat sink and save little or no power.

7. Sect. 151(f).3. Fenestration. There are three issues I want to address: 1) The proposed Package glazing area would be increased from 16% to 20% in inland climate zones, with no off-setting energy savings for single-family residences; 2) Multi-family residences currently do not have a separate glazing allowance, even though this building type typically has much small glazing areas (in relation to floor area) than do single-family houses; 3) The proposed Low-Rise Residential ACM eliminates credit for glazing areas that are less than the package standard. The small glazing area credit should remain, as less glazing is a legitimate energy saving feature. Eliminating this credit makes the Standards appear to be less rational, which will likely create less respect for the Standards.

   Proposals:
   A) If the glazing allowance is increased, the package should be modified in other respects so that it is energy-neutral. If a 16% package is retained, then a new additional 20% package could use higher AC efficiency as a trade-off (I believe that the state cannot set minimum mechanical system efficiency higher than federal minimum for a basic compliance approach). If a 16% package is not retained, the increased glazing area could be offset with lower fenestration U-factor and/or increased duct insulation.

   B) Establish a separate glazing allowance for multi-unit residences. Ideally, this would match a proposed new standard for High-Rise Residential (or Large Multi-Family). See item 2 above for proposed multi-family glazing allowances.

   C) The Low-Rise Residential ACM should continue to give credit for glazing areas that are below the Package allowance.

8. Sect. 151(f)8.A. Single Dwelling Unit Water Heaters. The “Standard” water heater is a storage type, even though certain tankless water heaters are more efficient.

   Proposal: Allow gas-fired tankless water heaters with electronic ignition to meet the "standard gas water heater" definition. Unlike storage type water heaters, there would be no limit on the number of qualifying tankless systems that can be installed.

9. Sect. 151(f)8.B. Multiple Dwelling Central Water Heaters. The proposed language calls for time controls for multi-family central DHW systems. This would make hot water difficult or impossible to acquire in the off hours, which is discriminatory.

   Proposal: Mandate temperature control instead of time control on central DHW systems.

10. Sect. 152(b)1.A. Low-Rise Residential Alterations. The proposed language requires glazing additions to meet the Package glazing area, or otherwise use the performance compliance approach. In homes exceeding the Package glazing allowance, the performance approach would probably result in a required upgrade to the house to

offset the proposed new glazing. While the rationale for this is valid – the current Standards contain no limit on the amount of glazing that can be added – this proposal is too burdensome for small glazing area additions.

Proposal: Allow a certain maximum area of glazing to be added to a residence without requiring Title 24 calculations. An appropriate area might be around 25 square feet per construction permit. This would make it very difficult to end up with a glass house. If a permit applicant wants to add a greater area of glazing, then they could show compliance with the performance approach, or show that the proposed total glazing area does not exceed the Package allowance.

Also, I want to thank the CEC for including the west glass area limit under Package compliance. Please feel free to contact me should you have any questions about the above comments.

Sincerely,

Gary Farber
FARBER ENERGY DESIGN